

Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Tributary to Pond Creek

(Effective Oct. 30, 2009, name corrected in Missouri Water Quality Standards to "Pond Creek.")

Water Body Segment at a Glance:

County: Washington
Nearby Cities: Mineral Point and Potosi
Length of impaired segment: 1.0 mile
Length of impairment within segment: 0.5 miles
Pollutant: Inorganic Sediment
Source: Barite Tailings Pond



State map showing location of watershed

Water Body Identification (WBID): 2128

TMDL Priority Ranking: Low

Description of the Problem

Beneficial uses of Pond Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health (Fish Consumption)

Use that is impaired

- Protection of Warm Water Aquatic Life

Standards that apply

Standards for inorganic sediment may be found in the general criteria section of the WQS, 10 CSR 20-7.031(3)(A), (C) and (G) where it states:

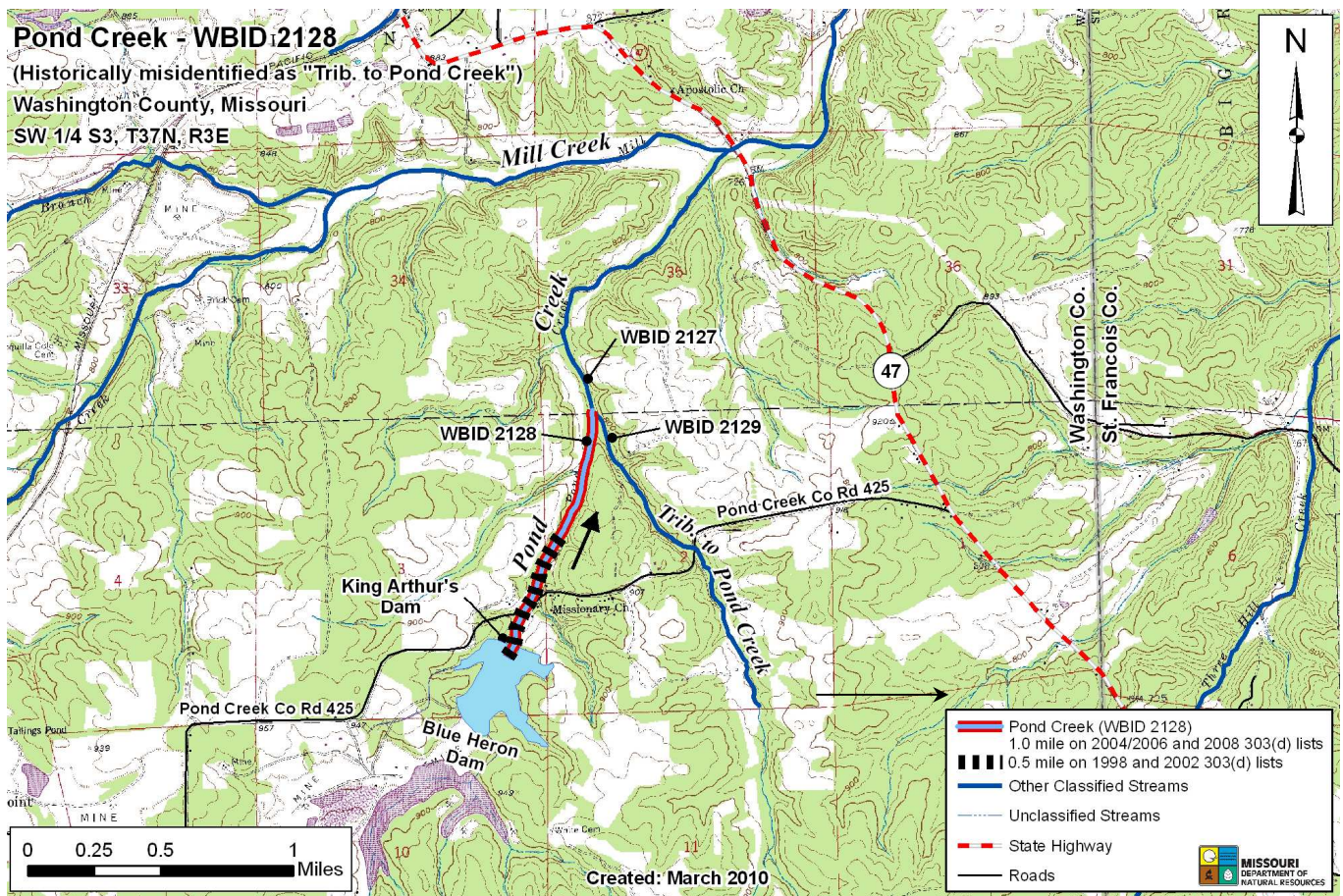
- (A) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
- (C) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.
- (G) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community.

And from 10 CSR 20-7.031(4)(H):

- (H) Solids. Water contaminants shall not cause or contribute to solids in excess of a level that will interfere with beneficial uses. The stream or lake bottom shall be free of materials which will adversely alter the composition of the benthos, interfere with the spawning of fish or development of their eggs or adversely change the physical or chemical nature of the bottom.

Background Information and Water Quality Data

This water quality limited-stream in Washington County has historically been misnamed in Missouri's Water Quality Standards and 303(d) lists as "Tributary to Pond" Creek. Effective Oct. 30, 2009, the name of this water body segment (WBID 2128), as listed in 10 CSR 20-7.031, Table H, was changed to Pond Creek in order to agree with how the stream is identified in the U.S. Geological Survey's Geographic Name Information System (GNIS; <http://geonames.usgs.gov/pls/gnispublic/>). Any related future Missouri 303(d) lists will reflect this correction. As such, the impaired segment on which a TMDL will be developed will be referenced though out this document as "Pond Creek." Another final modification from previous 303(d) listings is a change by the Environmental Protection Agency (EPA) to list the entire classified segment length of one mile as impaired instead of the previous listing of only the upper 0.5 mile (See Figure 1).



→ Direction of Flow

Figure 1. Map of impaired segment of Pond Creek in Washington County, Missouri.

The pollutant affecting Pond Creek is inorganic sediment. Inorganic sediment is essentially the same thing as mineral solids (like silt, sand or gravel) that are associated with soil erosion or erosion of mine-waste materials or stockpiles. When these solids get into a stream, they settle onto the bottom and smother natural substrates (natural materials making up the streambed), aquatic invertebrate animals and fish eggs. In this situation, the inorganic sediment impairing Pond Creek was thought to be a product of barite mining in the area.

Barite, or barium sulfate, was mined in many areas of southern and eastern Washington County. Also known as “tuff,” barite is a mineral used in well-drilling mud, chemical manufacture, fillers and extenders, face powders, chocolate coatings, golf and bowling ball cores, glass making, with X-rays and in paint. The first step in processing barite is to wash the mined material to separate the barite ore from the red clay and gravel found with it. The separated clay and gravel are discharged to barite tailings ponds and allowed to settle out. Overflows of water from these tailings ponds, especially during active washing, can contain suspended clay material that subsequently is deposited on the bottom of receiving streams.

Visual inspections of this stream, conducted for years before the first 303(d) listing in 1998, were made immediately downstream of a then active barite settling pond (King Arthur’s Dam) on upper Pond Creek and showed an excessive amount of red clay fines being deposited in the stream. Although all mining in the area had ceased by early 2002, fine material continues to be deposited in the creek below King Arthur’s Dam.

In October 2002, the department conducted a qualitative examination of the aquatic invertebrate benthic community of this stream, two other streams with an inactive barite tailings pond, and one without a barite tailings pond, which was used as a control. The results of this survey are summarized in Table 1. Using this evaluation methodology, a stream’s biological community is considered healthy if the number of EPT taxa¹ in the stream are equal to or greater than those found in one quarter of the reference streams in its area (i.e., high quality streams in the ecological drainage unit, or EDU). Note that Rubeneau Creek, although considered the “control” stream in this particular study, is not a reference stream. In this case, the number of EPT taxa in the 25th percentile in the fall in reference streams in the area (the Meramec basin) is eight. In the 2002 study, Pond Creek had the highest number of EPT taxa and the highest number of total taxa of the streams studied and may have represented a typical number for an unimpaired stream of this size in this area of the state. Regardless, since the general water quality standards were not being met (i.e., excess sediment), Pond Creek continued to be included in the 2002, and subsequent 303(d) lists of impaired waters.

Table 1. Summary of qualitative aquatic invertebrate sampling of four streams in eastern Washington County, Oct. 2002.

<i>Stream</i>	<i>Total Number of Taxa</i>	<i>Total Number of EPT* Taxa</i>
Tributary to Pond Creek – inactive tailings pond	23	7
Tributary to Mineral Fork – inactive tailings pond	20	6
Rubeneau Creek – control	16	6
Shibboleth Branch – inactive tailings pond	17	5

* EPT= Ephemeroptera, Plecoptera and Trichoptera (Mayflies, Stoneflies and Caddisflies)

For more information write or call:

Missouri Department of Natural Resources
 Water Protection Program, WQMAS
 P.O. Box 176
 Jefferson City, MO 65102-0176
Telephone: 1-800-361-4827 or (573) 751-1300 Program office
Facsimile: (573) 522-9920
Program Home Page: www.dnr.mo.gov/env/wpp/index.html

¹ “EPT” taxa are those three taxonomic Orders of aquatic insects (See Table 1) most intolerant of poor water quality.